MEMORANDUM FOR: Distribution

FROM: W/OPS1 - Mark Paese (Acting)

SUBJECT: Expansion of Console Replacement System (CRS)

1. Material Transmitted:

    Engineering Handbook No. 7 (EHB-7), Communications Equipment,
    section 3.4, Modification Note 70, Console Replacement System
    Output Channel Expansion (Large 5 to a Maximum 9).

2. Summary:

    Request for Change AA620 authorizes CRS expansion for National
    Weather Forecast Office (WFO) Gray, Maine (GYX).

3. Effect on Other Instructions:

    None.

    Distribution:
    W/OPS13 - J. Sabel   W/WFO - CAE - D. Spohn
    W/OPS13 - M. Brown   W/WFO - CLE - T. Rutkowski
    W/OPS13 - TRL   W/WFO - GYX - J. Lucas
    W/OPS16 - A. Morris   W/WFO - PHI - R. Paxson
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    W/ER41x4 - H. Machado   W/WFO - GYX - C. McGrath

COMMUNICATIONS EQUIPMENT MODIFICATION NOTE 70 (for Electronics Technicians)
Maintenance Branch
W/OPS12: GSS

SUBJECT   :   Console Replacement System (CRS) Output Channel Expansion

PURPOSE   :   To expand the capabilities of the CRS system from a Large 5-channel
                                to a Maximum 9-channel configuration.

SITES   :   <u>Site Name</u>   <u>SID</u>   <u>Org. Code</u>
AFFECTED   WFO Gray, ME   GYX   WN9938

EQUIPMENT   :   CRS (B440)
AFFECTED

PARTS REQUIRED   :   The parts required will be issued to each site by W/OPS12 from the
                                National Logistics Support Center under the applicable approved site-
                                specific Request for Change.

                                (1) Front-end processor (FEP) hold down strap (ASN: B440-STRAP)
                                (1) FEP computer (ASN: B440-2A2)
                                (1) FEP hard disk drive (HDD) (ASN: B440-2A2A8-FEP)
                                (1) Local area network (LAN) board (ASN: B440-1A8A10)
                                (1) LAN cable segment (ASN: B440-2W1)
                                (1) BNC tee connector (ASN: B440-4J1)
                                (1) FEP switch VGA video cable (ASN: B440-2W3)
                                (1) FEP switch PS/2 keyboard cable (ASN: B440-2W4)
                                (4) DECtalk cards (ASN: B440-2A2A11)
                                (4) Audio switch module (ASM) cards (ASN: B440-2A6A3)
                                (4) DECtalk-ASM audio cables (ASN: B440-4W12)
                                (2) NOAA Weather Radio Specific Area Message Encoder
                                (NWRSAME)-audio control panel (ACP) interface cables
                                (ASN: B440-1A5W4)
                                (1) DOS formatted diskette with CRS test database ASCII files
                                (provided by W/OPS12)

PARTS SUPPLIED   :   The following parts are to be provided by the site:
BY THE SITE   (4) Transmitter audio output cables
                                (4) NWRSAMEs (if available)
                                Cable marking tags and tie-wraps as needed

TOOLS AND TEST EQUIPMENT REQUIRED	:	#1 and #2 Phillips screwdrivers CRS test database ASCII files diskette provided by W/OPS12 (see Parts Required) Small flat-blade jeweler's screwdriver Root mean square (RMS) voltmeter/dB meter 600-ohm dummy load with a RJ-11 plug attached Anti-static workstation kit
TIME REQUIRED	:	5 Hours
EFFECT ON OTHER INSTRUCTIONS	:	None.
AUTHORIZATION	:	The authority for this modification is Request for Change AA620.
VERIFICATION STATEMENT	:	This procedure was tested and verified at National Weather Service Headquarters, Silver Spring, Maryland (SLVM2).
GENERAL	:	The attachments in this procedure contain instructions for adding output channel(s) to the CRS.
PROCEDURE	:	Attachment **A** provides procedures for implementing this modification. Attachment **B** (CRS Hardware Drawings) provides reference information. Attachment **C** provides verification of the new physical configuration (used before applying power). Attachment **D** provides a completed sample of a WS Form A-26, Maintenance Record.

REPORTING : Report the completed modification on a WS Form A-26, according to
INSTRUCTIONS the instructions in Engineering Handbook No. 4 (EHB-4), Engineering
Management Reporting System (EMRS), Part 2, and EHB-4, Appendix
I. Include the following information on the WS Form A-26:

    a. An equipment code of **CRSSA** in block 7.
    b. A serial number of **001** in block 8.
    c. The **ASN** and **NSN** of the FEP in block 13.
    d. A Mod No. of **70** in block 17a.
    e. **Serial number** for the FEP in block 18.

A sample WS Form A-26 is provided as attachment **D**.

Mark Paese (Acting)
Chief, Maintenance, Logistics, and Acquisition Division

Attachment A - Modification Procedure
Attachment B - CRS Hardware Drawings
Attachment C - New Configuration Physical Verification
Attachment D - WS Form A-26 Sample

Attachment A

Modification Procedure

Attachment A
Modification Procedure

Overview

This modification note provides instructions for expanding a Console Replacement System (CRS) from a Large 5-channel configuration to a Maximum 9-channel configuration. The modification procedure contains seven parts:

1. CRS Power-Down Procedures
2. Equipment Upgrade Procedures
3. CRS Power-Up Procedures
4. CRS Login, Application Software Error Verification, and Test Database ASCII File Loading Procedures
5. Post Hardware Expansion Channel Operability Verification Procedures
6. Adding New Transmitter Channels and Editing Site Database ASCII File Procedures
7. ASM Alignment Procedures

NOTE: 1. Read the entire procedure and verify receipt of all required parts before proceeding with the actual modification.

2. Coordinate with the operations staff before performing this procedure.

CAUTION

CRS must be down to perform the expansion modification. This modification contains test messages that should not be broadcast on any transmitter.

In addition, the database ASCII file will be recompiled, and all dictionary files will be lost! Switch to the backup NWR system, and ensure the dictionary files are backed up (see the *CRS System Administration Manual*) before performing this modification.

NOTE: The new FEP setup procedures in part 2, sections 2.1, 2.2, and 2.3, can be performed prior to shutting down the system. This will save downtime of a CRS system that is currently operational.

PART 1 - CRS POWER-DOWN PROCEDURES

1.1   CRS Application Shutdown Procedure

    1.   Click the **System** menu and click **Stop System**.

    2.   Wait until all icons on the *CRS System Status* menu turn **red**.

1.2 UNIX Shutdown Procedure

NOTE: 1.   The shutdown of the CRS application is just one task before the graceful power-down. After stopping the CRS application software, implement a "controlled/orderly UNIX shutdown with NO automatic reboot" on the main processor (MP), and implement a "controlled/orderly UNIX shutdown" on all FEPs. Upon completion of the controlled/orderly UNIX shutdown, power-down the processors in the following order: MPs first followed by the FEPs.

---

    1.   Click the **Maintenance** menu in the main CRS menu to access the *Maintenance* pull-down menu.

    2.   Click **UNIX Shell** in the *Maintenance* pull-down menu. A *UNIX xterm* window pops up for the entry of UNIX commands.

    3.   Type the following UNIX command in the *xterm* window:

           su root

    4.   Press the **Enter** key. The shell responds with a prompt to enter root passwords.

    5.   Type the password for the root.

    6.   Press the **Enter** key. The shell prompt changes to a pound sign indicating all subsequent UNIX command entries have root authority.

    7.   Type the following UNIX command in the *xterm* window:

           rsh 5MP /sbin/shutdown -i0 -g0 -y

    8.   Press the **Enter** key. The shell command prompt returns after displaying a confirmation of shutdown initiation on 5MP. The UNIX on processor 5MP shuts down.

    9.   Type the following UNIX command in the *xterm* window:

           rsh 1FEP /sbin/shutdown -i0 -g0 -y

    10.   Press the **Enter** key. The shell command prompt returns after displaying a confirmation of shutdown initiation on 1FEP. The UNIX on processor 1FEP shuts down.

11. Type the following UNIX command in the *xterm* window:

   rsh 2FEP /sbin/shutdown -i0 -g0 -y

12. Press the **Enter** key. The shell command prompt returns after displaying a confirmation of shutdown initiation on 2FEP. The UNIX on processor 2FEP shuts down.

13. Type the following UNIX command in the *xterm* window:

   rsh 4BKUP /sbin/shutdown -i0 -g0 -y

14. Press the **Enter** key. The shell command prompt returns after displaying a confirmation of shutdown initiation on 4BKUP. The UNIX on processor 4BKUP shuts down.

15. Type **cd /** in the *xterm* window.

16. Press the **Enter** key.

17. Type the following UNIX command in the *xterm* window:

   /sbin/shutdown -i0 -g0 -y

18. Press the **Enter** key. Each CRS processor for the system may be safely powered down when UNIX indicates shutdown is complete with the following message:

   Press any key to reboot

NOTE: 2. Do not reboot any machine, go to section 1.3.

1.3 CRS Hardware Power-Down Procedure

   Power-down all CRS equipment at the operator's station and in the equipment room by turning off the following:

   Operators Station   Equipment Room

   0MP and Monitor   4BKUP
   5MP and Monitor   1FEP
   NWRSAME (all)   2FEP
                          LAN bridge
                          LAN server
                          Monitor
                          Printer
                          Audio switching assembly (ASA) power supplies
                          Modem

PART 2 - EQUIPMENT UPGRADE PROCEDURES

> **NOTE:** The new FEP setup procedures in part 2, sections 2.1, 2.2, and 2.3, can be performed prior to shutting down the system. This will save downtime of a CRS system that is currently operational.

2.1 Preliminary 3FEP Setup Procedure

> **NOTE:** Removing and replacing circuit cards must be accomplished in an antistatic work area using approved antistatic procedures.

1. Remove the right side cover of the new 3FEP unit using the following procedure:

    a. Remove the right three screws located on the back of the system unit (see attachment B, figure A-1). These screws secure the right side access panel of the system to the chassis.

    b. Pull the panel backward while lifting it upward.

2. Remove the screws holding expansion slot covers 1, 2, 3, and 4, and retain the screws (see attachment **B**, figure A-13).

3. Remove the expansion slot covers.

4. Install the new LAN card (ASN: B440-1A8A10) in expansion slot number 1, and reinstall a retaining screw.

2.2 Installation of the HDD and Cage Combination Procedure

1. Align the three slides on the HDD cage with the three slots on the upper left corner of the chassis.

2. Insert the slides into the slots holding the HDD cage at an angle away from the chassis.

3. Slide the HDD cage towards the bottom of the chassis, and swing the HDD cage into the chassis body.

4. Align the two screw slots at the top with the threaded holes in the chassis, and secure the HDD cage with two screws.

5. Secure the HDD cage with a single screw at the tab located at the lower right corner of the HDD cage (see attachment **B**, figure A-13).

6. Hook up the HDD cable to the HDD. Cable connectors are keyed and only fit one way. Connect the other end of the HDD cable to the small computer system interface (SCSI) port on 3FEP motherboard.

7.   Connect a power connector from the power supply to the HDD.

2.3 3FEP DECtalk Cards Configuration and Installation Procedure

1.   Configure each new DECtalk card for the appropriate Input/Output (I/O) address through switch 2 (SW2) as defined in table 1 and pictured in attachment **B**, figure A-11.

NOTE:	1. Depending on the CRS site configuration, there may be as many as five DECtalk cards per FEP, located in slots two through six.

Table 1. DECtalk Card Switch 2 (SW2) Settings

Module Number	SW2-1	SW2-2	SW2-3	SW2-4	SW2-5	SW2-6	I/O Address	PC Slot
4	off	off	off	off	on	on	380	6
3	off	off	on	on	off	on	360	5
2	on	off	on	off	off	on	328	4
1	off	on	off	on	off	off	250	3
0	off	off	off	on	off	off	240	2

NOTE:	2. Regardless of FEP, DECtalk card configuration remains constant, meaning modules 0, 1, 2, 3, and 4 are configured the same for each FEP.

2.   Use table 1 to set up a DECtalk card with the I/O address: 240
      Install the DECtalk card into slot 2 of 3FEP, and reinstall a retaining screw.

3.   Use table 1 to set up a DECtalk card with the I/O address: 250
      Install the DECtalk card into slot 3 of 3FEP, and reinstall a retaining screw.

4.   Use table 1 to set up a DECtalk card with the I/O address: 328
      Install the DECtalk card into slot 4 of 3FEP, and reinstall a retaining screw.

5.   Replace the 3FEP cover removed using the reverse procedure in section 2.1, step 1.

NOTE:	3. Perform Part 1, CRS Power-Down Procedure before proceeding.

2.4 2FEP DECtalk Card Installation Procedure

NOTE:	Removing and replacing circuit cards must be accomplished in an anti-static work area using approved anti-static procedures. Refer to attachment **C** and ensure all equipment cabling is properly marked before removal.

1.   Remove all cabling from 2FEP, and remove FEP from the equipment rack to the anti-static work area (see attachment B, figure A-5).

2.   Install the new DECtalk card into slot 4 of the 2FEP unit using the following procedure:

   a. Access the DECtalk cards by removing the right three screws located on the back of the system unit (see attachment B, figure A-1). These screws secure the right side access panel of the system to the chassis.

   b. Pull the panel backward and lift upward.

3.   Remove and retain the screw holding the slot 4 expansion slot cover.

4.   Remove the cover.

2.5 2FEP DECtalk Card I/O Address Configuration Procedure

1.   Configure the new DECtalk card for the appropriate I/O address through switch 2 (SW2) as defined in table 2 and pictured in attachment **B**, figure A-11.

NOTE:	1. Depending on the CRS site configuration, there may be as many as five DECtalk cards per FEP, located in slots two through six.

Table 2. DECtalk Card Switch 2 (SW2) Settings

Module Number	SW2-1	SW2-2	SW2-3	SW2-4	SW2-5	SW2-6	I/O Address	PC Slot
4	off	off	off	off	on	on	380	6
3	off	off	on	on	off	on	360	5
2	on	off	on	off	off	on	328	4
1	off	on	off	on	off	off	250	3
0	off	off	off	on	off	off	240	2

NOTE:	2. Regardless of the FEP, DECtalk card configuration remains constant, meaning that modules 0, 1, 2, 3, and 4 are configured the same for each FEP.

2.   Use table 2 to set up a DECtalk card with the I/O address: 328
Install the DECtalk card into slot 4 of 2FEP, and reinstall a retaining screw.

3.   Replace 2FEP right side cover using the reverse procedure in section 2.4, step 2.

4.   Replace 2FEP in the CRS main unit cabinet and reinstall all cabling with the exception of the DECtalk-ASM audio cables.

2.6 3FEP Computer Installation Procedure

1.   Install 3FEP in the CRS main unit cabinet.

2.   Install the new 3FEP switch VGA video cable between 3FEP video out and switch position C.

3.   Install the new FEP switch PS/2 keyboard cable between 3FEP keyboard connection and switch position C.

4.   Install the new LAN cable segment and BNC tee connector to connect the 3FEP PC into the existing CRS LAN; 3FEP connects between 2FEP and 5MP. (See attachment B, figure A-15).

2.7 ASM Card Installation Procedure

1.   Remove ASA slot 6, 7, 8, and 9 covers by removing the two screws.

NOTE:	There are five jumpers to be set on each ASM card.

2.   Take one of the new ASM cards, and set the jumpers for slot 6 of the ASA according to table 3.

3.   Install the new ASM card into slot 6 of the ASA chassis, and tighten the two screws.

4.   Repeat steps 2 and 3 for each of the remaining ASM cards.

Table 3. ASM Card Jumper Settings

	ASA Slot #	Silence Alarm Jumper "JP1"	ACP Channel Sel. Jumper "JP2" & "JP3"	BKUP Live/ Playback Cntrl Jumper "JP4"	FEP Select Jumper "JP5"
ASM 1 (channel 1)	1	EN (Enable)	1	BUL2	FEP1
ASM 2 (channel 2)	2	EN (Enable)	2	BUL2	FEP1
ASM 3 (channel 3)	3	EN (Enable)	3	BUL2	FEP1
ASM 4 (channel 4)	4	EN (Enable)	4	BUL2	FEP2
ASM 5 (channel 5)	5	EN (Enable)	5	BUL2	FEP2
ASM 6 (channel 6)	6	EN (Enable)	6	BUL2	FEP2
ASM 7 (channel 7)	7	EN (Enable)	7	BUL2	FEP3
ASM 8 (channel 8)	8	EN (Enable)	8	BUL2	FEP3
ASM 9 (channel 9)	9	EN (Enable)	9	BUL2	FEP3
ASM PB1 (mon/playback chan 1)	PB1	DIS (Disable)	PB1	PB	FEP1
ASM PB2 (mon/playback chan 2)	PB2	DIS (Disable)	PB2	PB	FEP2

2.8 New and Existing DECtalk-ASM Audio Cable Installation Procedure

Using write-on cable labels, mark and connect the DECtalk-ASM audio cables according to table 4.

Table 4. DECtalk to ASM Audio Cables

From	To	Cable Label
1FEP DECtalk 1 "J2" Port	ASM 1 "IN Port"	1-1
1FEP DECtalk 2 "J2" Port	ASM 2 "IN Port"	1-2
1FEP DECtalk 3 "J2" Port	ASM 3 "IN Port"	1-3
2FEP DECtalk 1 "J2" Port	ASM 4 "IN Port"	2-1
2FEP DECtalk 2 "J2" Port	ASM 5 "IN Port"	2-2
2FEP DECtalk 3 "J2" Port	ASM 6 "IN Port"	2-3
3FEP DECtalk 1 "J2" Port	ASM 7 "IN Port"	3-1
3FEP DECtalk 2 "J2" Port	ASM 8 "IN Port"	3-2
3FEP DECtalk 3 "J2" Port	ASM 9 "IN Port"	3-3
1FEP DECtalk 5 "J2" Port	ASM PB1 "IN Port"	1-5
2FEP DECtalk 5 "J2" Port	ASM PB2 "IN Port"	2-5

2.9 New Transmitter Audio Output Cables Installation Procedure

1.   Install the new audio output cable by connecting the OUT1 port of the new ASM cards at slots 6, 7, 8, and 9 of the ASA chassis to the Demarc Panel position for the new transmitters.

2.   Install the new NWRSAME (if available) into the top panel of the 5MP workstation (if available).

3.   Install the NWRSAME-ACP interface cable from the NWRSAME rear connector to the "NWRSAME INPUT 1" port of ACP2 rear panel (this connects to pins 2, 6, 7, 9, and 10 of the NWRSAME) (if available).

NOTE: This completes the hardware modification.

PART 3 - CRS POWER-UP PROCEDURES

WARNING

Prior to powering up the FEPs, perform the *New Configuration Physical Verification* procedure contained in attachment C to verify proper system configuration. Failure to perform the procedure can result in transmitter broadcasts assigned to incorrect output channels.

3.1 Power-Up FEP Procedure

1.   Press the **ON/OFF** switch (located on the front center right of the enclosure) to power-up the FEPs. A green power LED on each FEP lights when power is on. The FEPs can be powered up in any sequence. The FEPs go through a memory check, display the system configuration [as recognized by the basic I/O system (BIOS)], then boot the embedded operating system. At the completion of the boot process, the console screen displays the prompt:

     Console Login:

     The embedded operating system automatically initializes to a pre-set level and then waits for final start-up commands from the master MP.

NOTE: The FEPs share a common console through the *Shared Monitor Switch*. The console displays messages while completing the boot process of the FEP currently switched in.

---

2.   Use the *Shared Monitor Switch* to select the next FEP. The console monitor displays:

     Press <F1> to resume, <F2> to Setup.

3.   Press **F1** to complete the boot process. The prompt displays:

     Console Login:

4.   Repeat for each remaining FEP.

3.2 Power-Up Main Processors Procedure

NOTE:	1. Power-up 0MP as the master main processor and 5MP as the shadowing processor.

Press the **ON/OFF** switch (located on the front center right of the enclosure) to power up the MPs. A green power LED on each MP lights when power is on. The MPs can be powered up in any sequence. The MPs go through a memory check, file system check, system configuration verification (as recognized by the BIOS), and then boot the embedded UNIX operating system. At the completion of the boot process, the workstation screen displays the *CRS Login* screen. The MPs are now ready for the initialization of the CRS application software.

NOTE:	2. For Build 6.4 and higher: Following power-up, CRS displays the *Security Screen*. To continue the login process, click the **Acknowledge** button.
	3. Whenever the MPs are powered up, they automatically step through the boot process to the multiuser mode without operator intervention.

3.3 CRS Application Software Installation on the New FEP Procedure

1. If the 0MP was rebooted, at the *Login GUI* window, login as the root user.

2. Click the **KDE Desktop Application Starter** icon (the big K Wheel icon) in the lower left part of the *KDE Desktop* panel. If the 0MP was not rebooted, proceed to step 3.

3. Click the **SCO Control Center** pop-up menu selection.

NOTE:	1. You also may start the *SCO Control Center* by clicking the **SCO Admin** icon on the KDE Desktop panel (the *Swiss Army Knife* icon).

4. Select and double-click the **Software_Management** menu selection.

5. Double-click the **Applications Installer** menu selection.

6. Insert the CD-ROM into the CD drive of the selected installation MP, then select **CD-ROM_1** from the pop-up menu, following the *Install from:* prompt in the upper half of the **Application Installer** window.

7. After the CRS application package icons (**crsopsais**, **crsopsfpm** and **crsopsmpm**) are displayed immediately below the *Install from* prompt, select **crsopsais**, and click **Install**.

NOTE:	2.	Both **crsopsfpm** and **crsopsmpm** <u>can only be installed indirectly</u> through **crsopsais**.

8.   Respond to the prompts displayed in the **Add Application: crsopsais** and **auto_install** terminal windows.

NOTE:	3.	The *Add Application: crsopsais* window and the *auto_install* window are used to display the installation activity log as well as the prompts to the installation operator. The log information and the prompt sequences vary depending on the responses to the prompts.

9.   When the installation process completes, the CRS displays the following:

Continue [0MP | 5MP] shutdown? (Default: y)

NOTE:	4.	Shutting down the installation MP [0MP	5MP] is an option. It is not necessary to shut down after the software has been installed on an FEP. A shut down is RECOMMENDED after CRS software has been installed on an MP to ensure that the installation MP [0MP	5MP] and the other MP [0MP	5MP] are functionally synchronized as CRS master and CRS shadow.

10.   Press **Enter** to continue.

NOTE:	5.	For Build 6.4 and higher: Following power-up, CRS displays the *Security Screen*. To display the *Login* screen and continue the login process click the **Acknowledge** button.

11.   The FEP physically connected through the *Shared Monitor Switch* starts itself automatically following shutdown. To complete the startup sequence for the remaining FEPs, use the **Shared Monitor Switch** on the equipment rack to select the next FEP for rebooting. The console monitor displays:

Press <F1> to resume, <F2> to Setup.

12.   Press **F1** to complete the boot process. The prompt displays:

Console Login:

13.   Repeat for each remaining FEP.

PART 4 - CRS LOGIN, APPLICATION SOFTWARE ERROR VERIFICATION, AND TEST DATABASE ASCII FILE LOADING PROCEDURES

4.1 CRS Login Procedure

<table>
<tr>
<td>NOTE:</td>
<td>1.</td>
<td>For Build 6.4 and higher: Following power-up, CRS displays the <i>Security Screen</i>. To continue the login process, click the Acknowledge button.</td>
</tr>
<tr>
<td></td>
<td>2.</td>
<td>The <i>CRS Login Screen</i> allows you to log onto CRS. This screen contains two fields: <i>Login ID</i> and <i>Password</i>. The fields allow you to type in your assigned login ID and password.</td>
</tr>
</table>

1. Type **admin** (for system administrator) in the *Login ID* field, and press **Enter**. The cursor moves to the *Password* field.

2. Type in your assigned password, and press **Enter** to complete the CRS login process. The system displays the *CRS Main* display. In addition, the system displays the following error message:

   System is not operational. Perform 'Start CRS' to start system.

3. Click **OK** to clear the message.

<table>
<tr>
<td>NOTE:</td>
<td>3.</td>
<td>The error message is only a status message indicating that CRS is not running.</td>
</tr>
</table>

4.2 CRS Applications Software Installation Error Verification Procedure

1. Open a *UNIX Shell*:

   a. Click **Maintenance**

   b. Click **UNIX Shell**

2. Type **grep ERROR /crs/install.log** and press **Enter**.

3. Ensure there are no error messages. Any error messages must be reported to the CRS Site Support Staff at 301-713-0191 x139 or x119.

4. Type **grep WARNING /crs/install.log** and press **Enter**.

5. Ensure there are no error messages. Any error messages must be reported to the CRS Site Support Staff at 301-713-0191 x139 or x119.

<table>
<tr>
<td>NOTE:</td>
<td>Ignore any IP address error messages.</td>
</tr>
</table>

4.3 CRS Test Database ASCII File Loading Procedure

NOTE:	1.	The following instructions for loading the CRS test database ASCII file assume everything is being done with 0MP set as the MP.

1. Open a UNIX Shell:

    a. Click **Maintenance**.

    b. Click **UNIX Shell**.

2. Place the diskette with CRS test database ASCII files in the 0MP diskette drive to copy the desired file from the diskette to CRS.

    a. Type **mdir a:** and press the **Enter** key to display a directory listing of the files on the test database diskette. There are 13 files on the diskette with the following filename convention:

    TYP*W*_CFG.ASC   where W = 1 - 4
    LRG*X*_CFG.ASC   where X = 5 - 8
    MAX*Y*_CFG.ASC   where Y = 9
    MAX*Z*_CF.ASC   where Z = 10 - 13
    (*W, X, Y,* and *Z* represent the number of channels supported by your CRS.)

    b. Locate the applicable test database ASCII file.

    c. Type **mcopy -t a:*filename* /crs/data/SS/*filename*** (where *filename* is the name of the CRS test database ASCII file to be used).

    d. Press the **Enter** key.

3. Click and hold the left mouse button on any white space, move the cursor to select **XCRS_SITE Utility,** and release the button to bring up the *XCRS_SITE Utility* window.

4. Click the **Select ASCII Site Setup** button to bring up the list of ASCII files.

5. Select the desired database ASCII filename you copied from the diskette in section 4.3, step 2.c, and double click it.

NOTE:	2.	The directory selection block has a default directory name of */crs/data/SS*, and the file filter block has a default file name of */crs/data/SS/*.ASC*. If the desired filename does not appear, it may have copied to the wrong directory in section 4.3, step 2.c. If that is the case, change the default directory name to the directory specified in section 4.3, step 2.c. The other reason the filename does not appear is because it is being filtered out. Remember, UNIX is case sensitive and if copied with an asc extension that was in lower case, it does not display. Change the filter file name to **/crs/data/SS/*.asc** and the filename displays.

6.   Select *Initialize System Configuration and Database* to ensure the entire system database and configuration is erased and replaced.

7.   Click the **Start Site Configuration** button. The system displays:

Will now perform FULL site reconfiguration. Continue?

8.   Click **OK**. The "wristwatch" and the "working" message display. Several messages scroll by. The last message reads:

Finished with site configure

The "wristwatch" and "working" message disappear. Ensure there are no error messages at the completion of the site configuration process. If errors occur, contact the CRS Site Support Staff at 301-713-0191 x139 or x119.

9.   Restart CRS by clicking **Start CRS System**. The system displays:

The CRS system will be STARTED. Continue?

10.   Click **OK**. The "wristwatch" and the "working" message display. Several messages scroll by. The last message refers to starting 4BKUP. The "wristwatch" and "working" message disappear.

11.   Click **Exit** to close the *XCRS_SITE Utility* window.

12.   Click the **UNIX shell** window to select it. At the prompt, type **Exit** and press **Enter** to close the *UNIX shell*.

13.   Open the *System Status* window:

   a. Click **System**.

   b. Click **System Status**.

14.   Monitor the *System Status* window, and ensure the system is operational.

PART 5 - POST HARDWARE EXPANSION CHANNEL OPERABILITY VERIFICATION PROCEDURES

5.1 Channel Operability Verification Procedure

NOTE: The CRS test database ASCII files contain test messages configured for continuous broadcast for channel operability verification.

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1.   Connect a monitor speaker or headphones to the ACP.

2. Use the *Channel Select* control to select each channel, one at a time, and monitor the output for the correct message (i.e., with *Channel one* selected, the message output is: *This is transmitter one, audio switch module one.*).

5.2 FEP Backup Mode Channel Operability Verification Procedure

1. Click **Maintenance**.

2. Click **Front-End Processor Switch**.

3. Select **3** in the *Front-End Processor Switch* window under *FEP*.

4. Select **Out** under *Switch*.

5. Select **Yes** under *Backup*.

6. Click the **Save the current record** icon to execute the FEP switch process. The *Question* window displays:

   Switch out the FEP FULLY offline ???

7. Click **OK** to continue. The system displays the "wristwatch" and the message:

   "Requesting FEP Switchout"

8. Monitor the **FEP3** and **BKUP System Status** icons and verify the *FEP3* is in the backup mode and the *4BKUP* icon displays the online status.

9. Upon completion of the FEP switch process, repeat section 5.1, steps 1 and 2.

10. Upon completion of the FEP backup mode channel operability verification, perform the following to display the *Front-End Processor Switch* window:

    a. Click **Maintenance**.

    b. Click **Front-End Processor Switch**.

11. Select the following in the *Front-End Processor Switch* window:

    a. Under *FEP*: select **3**.

    b. Under *Switch*: select **IN** to switch FEP3 back in.

    c. Click the **Save the current record** icon to execute the FEP switch process. The system displays the "wristwatch" and the message:

       Requesting FEP switch-in

12. Monitor the **FEP3** and **BKUP System Status** icons, to verify that *FEP3* is online and the *BKUP* icon displays the backup mode status.

13. When the system returns to normal operation, perform the following steps to close the *Front-End Processor Switch* window, and stop CRS:

a.   Select the following on the *Front-End Processor Switch* window:

   1)   Click **File**.

   2)   Click **Exit**.

b.   Select the following on the *Main CRS* menu:

   1)   Click **System**.

   2)   Click **Stop System**.

   3)   Click **OK**.

   4)   Click **Close**.

14.   Monitor the *System Status* window, and verify the CRS application has stopped.

PART 6 - ADDING NEW TRANSMITTER CHANNELS AND EDITING SITE DATABASE ASCII FILE PROCEDURES

6.1 Adding New Transmitter Channels Procedure

1.   Click and hold the left mouse button on any white space, move the cursor to select **XCRS_SITE Utility**, and release the button to bring up the *XCRS_SITE Utility* window.

2.   Click **Select ASCII Site Setup** button to bring up the list of ASCII files.

3.   Select the current site database ASCII file and double click.

4.   Click the **Add Transmitter(s)** button to start the **addxmt** program. It displays the number of channels currently available, the next available channel to be added, and its appropriate processor and slot.

5.   Use the following steps to add a new transmitter to the Site Database ASCII file:

   a.   **Mnemonic**

      1)   Type option number **1** and press **Enter** to select *Mnemonic*.

      2)   Type **a** and press **Enter** at the program prompt to add *Mnemonic*.

      3)   Type **mmmmm** and press **Enter** (where *mmmmm* is the desired mnemonic), up to a length of 5 characters. The program returns the *Mnemonic*.

      4)   Type **0** or press **Tab** and press **Enter** to complete the *Mnemonic* selection.

   b.   **Call Sign**

      1)   Type option number **2** and press **Enter** to select the *Call Sign*.

      2)   Type **a** and press **Enter** at the program prompt to add *Call Sign*.

3) Enter the *Call Sign* in the same manner as the *Mnemonic*, up to a length of 5 characters. The program returns the *Call Sign*.

4) Type **0** or press **Tab** and press **Enter** to complete the *Call Sign* selection.

c. **Frequency**

1) Type option number **3** and press **Enter** to select *Frequency*. The *Frequency* option only allows a selection of one of the seven choices listed.

2) Type **n** and press **Enter** (where *n* is the desired frequency choice). The program returns the *Frequency* choice by displaying an asterisk next to the *Frequency* selection.

3) Type **0** or press **Tab** and press **Enter** to complete the *Frequency* selection.

d. **Location**

1) Type option number **4** and press **Enter** to select *Location*.

2) Type **a** and press **Enter** at the program prompt to add *Location*.

3) Enter the *Location* (in the same manner as the *Mnemonic* and the *Call Sign*) up to a length of 40 ASCII characters. The program returns the *Location*.

4) Type **0** or press **Tab** and press **Enter** to complete the *Location* selection.

e. **Add Transmitter**

1) Type option number **5** and press **Enter** to use all the parameters defined in the first four steps to configure a new transmitter in the database ASCII file. The program indicates a new transmitter is really needed.

2) Type **y** and press **Enter**. The program returns the assignment of each transmitter to its proper processor and slot. The program tells you the appropriate database ASCII file has been updated and the original has been saved with the .SAV extension.

6. The program then asks if another transmitter is needed. If yes, repeat steps **5a** through **5e** for the next new transmitter. If not, type **n** and press **Enter** to exit the program.

6.2 Editing the Site Database ASCII File Procedure

1. When exit **addxmt** is done, the *Question* window displays:

   Ready to recompile selected ASCII file. Continue?

2. Click **Cancel** to close the *Question* window.

3. Select **Initialize System Configuration and Database** to ensure the entire system database and configuration is erased and replaced.

4. Click **Start Site Configure**. The *Question* window displays:

    Will now perform FULL site reconfiguration. Continue?

5. Click **OK** to recompile the database ASCII file. Upon completion of the database ASCII file recompile process, the system displays:

    Finished with site configure.

6. Restart CRS by clicking **Start CRS System**. The system displays:

    The CRS system will be STARTED. Continue?

7. Click **OK**. The "wristwatch" and the "working" message display. Several messages scroll by. The last message refers to starting 4BKUP, and the "wristwatch" and "working" message disappear.

8. Click **Exit** to close the *XCRS_SITE Utility* window.

9. Open the *Alert Monitor* window:

    a. Click **System**.

    b. Click **Alert Monitor**.

NOTE: No attempt is made by **addxmt** to establish station identifiers, broadcast programs, broadcast suites, message types, voice parameters, keep alive messages, interrupt messages, etc. for the new transmitters. These must be configured through the CRS graphical user interface (see the *CRS Site Operator's Manual*) and updated in the site database ASCII file.

PART 7 - ASM ALIGNMENT PROCEDURES

NOTE: The output of each added ASM card must be aligned before placing in service. The alignments must be performed in the following sequence:

1. Verify ACP **Ref.** Mark Alignment.

2. ASM Card Alignment.

7.1 Verify ACP Ref. Mark Alignment Procedure

NOTE: 1. The ACP Ref. mark alignment can be performed independently and does not require the use of any tool or equipment.

2. Transmitter x in this procedure refers to the channel under test.

---

1.   Set up the CRS for backup live (BUL). No system database is required.

2.   Set the index mark on the **tone volume control** knob to the **Ref.** position.

3.   Push the **Transmitter x** and **Enable** buttons in sequence to start BUL on channel x. The buttons are located in the **BACKUP LIVE** block area on the ACP front panel.

NOTE: 3. Do not send audio to a transmitter while performing this procedure.

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4.   Push the **Alert Tone 1** button to generate the 1050 Hz warning alert tone (WAT).

5.   Ensure the VU meter on the ACP front panel indicates **0 dBm**.

NOTE: 4. The duration of 1050 Hz WAT is 10 seconds.

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6.   Adjust the tone volume control for a reading of **0 dBm**.

7.   Repeat steps 4, 5, and 6 as necessary to obtain a reading of **0 dBm**.

NOTE: 5. When the tone volume control is set to the true Ref. position, the ACP provides the selected WAT output level of **0 dBm**.

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8.   To stop BUL, first push the **Enable** button, and then push the **Transmitter x** button.

7.2 ASM Card Alignment Procedure

> **NOTE:** 1. This alignment requires two people: one in the operations room and one in the equipment room.
>
> 2. When performing any of the following alignments, the system's output(s) must be disconnected from the telecommunications link and terminated into a 600-ohm load. All audio signal level measurements are taken across the 600-ohm load.

1. Assemble the following required equipment:

   - dB meter to read the audio signal level,
   - small jeweler's screw driver, and
   - 600-ohm dummy load with RJ-11 plug attached.

2. Set up the CRS for BUL. No system database is required.

3. Set the index mark on the tone volume control knob to the **Ref.** position as described in section 7.1.

4. Push the **Transmitter x** and **Enable** buttons in sequence to start BUL on channel x. The buttons are located in the **BACKUP LIVE** block area on the ACP front panel.

5. Plug the RJ-11 connector (with the 600-ohm load attached) into the RJ-11 jack of **OUT 1** on the ASM of transmitter x (output channel x).

6. Connect the dB meter across the 600-ohm load.

7. Push the **Alert Tone 1** button to send a WAT to the **OUT 1** jack of ASM card 1.

8. Measure and record the signal level in dB across the 600-ohm load.

9. Using a small jeweler's screwdriver, adjust the transmitter gain control potentiometer through the ASM front panel until a reading of **0 dBm** is obtained across the 600-ohm load.

> **NOTE:** 3. Table 5 provides equivalent V rms and V p-p values related to dBm (all referenced to 600-ohms) as an aid in referencing readings taken with measurement equipment that may not read directly in dBm.

Table 5. Voltages <u>vs</u> dBm (into 600-ohm load)

dBm	RMS	P-P		dBm	RMS	P-P		dBm	RMS	P-P
10	2.44	6.93		-4	0.48	1.35		-17	0.11	0.301
9	2.183	6.17		-5	0.43	1.2		-18	0.097	0.27
8	1.946	5.5		-6	0.39	1.03		-19	0.087	0.24
7	1.734	4.9		-7	0.345	0.96		-20	0.078	0.215
6	1.546	4.37		-8	0.306	0.85		-21	0.69	0.194
5	1.377	3.89		-9	0.275	0.76		-22	0.061	0.17
4	1.228	3.47		-10	0.245	0.68		-23	0.054	0.152
3	1.094	3.01		-11	0.213	0.61		-24	0.048	0.135
2	0.975	2.75		-12	0.192	0.54		-25	0.043	0.12
1	0.869	2.46		-13	0.173	0.48		-26	0.039	0.108
0	0.775	2.15		-14	0.154	0.43		-27	0.034	0.1
-1	0.69	1.94		-15	0.138	0.38		-28	0.031	0.09
-2	0.61	1.7		-16	0.125	0.34		-29	0.028	0.08
-3	0.54	1.52						-30	0.024	0.07

NOTE: 4. The WAT output from the ACP nominally lasts 10 seconds. It is recommended that a second person push the **Alert Tone1** button for a near continuous tone output. This smooths out the calibration effort and minimizes the time required.

5. Primary (OUT1) and secondary (OUT2) outputs are two independent outputs. However, the output level of OUT1 is affected by approximately 1.5 dB if OUT2 is loaded.

6. During BUL, the VU meter monitors the ACP tone output, not the output of the ASM card. The ACP tone output is sent to the ASM card via the ASC for final output.

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10.   Repeat steps 7, 8, and 9 as necessary to obtain a reading of **0 dBm** for the channel under test.

11.   To stop BUL, first push the **Enable** button, and then push the **Transmitter x** button.

12.   Repeat steps 1 through 10 to align each of the new ASM cards in the system.

13.   Remember to activate each ASM card output by pushing the respective **Transmitter x** button, and then the **Enable** button.